

WHAT IS CLAIMED IS:

- 1 1. A process for self-aligned manufacturing integrated electronic devices,
2 comprising the steps of:
 - 3 - forming, in a semiconductor wafer having a substrate, insulation structures
4 delimiting active areas and projecting from said substrate;
 - 5 - forming a first conductive layer coating said insulation structures and said
6 active areas; and
 - 7 - partially removing said first conductive layer;
8 wherein, prior to forming said first conductive layer, forming recesses in said
9 insulation structures.
- 1 2. The process according to claim 1 wherein said step of forming said first
2 conductive layer comprises filling said insulation structures.
- 1 3. The process according to claim 1 wherein said step of forming recesses
2 comprises removing side portions of said insulation structures so as to form first
3 recesses.
- 1 4. The process according to claim 3 wherein said first recesses are defined
2 on top and at the side of respective ones of said active areas.
- 1 5. The process according to claim 3 wherein said step of partially removing
2 comprises forming first conductive regions, which extend inside at least one of said
3 first recesses and on top of a respective said active area.
- 1 6. The process according to claim 5 wherein said first conductive regions are
2 floating gates of respective first memory cells.
- 1 7. The process according to claim 1 wherein said step of forming recesses
2 comprises removing central portions of said insulation structures so as to form
3 second recesses.
- 1 8. The process according to claim 7 wherein said second recesses are
2 delimited laterally and at the bottom by respective ones of said insulation structures.
- 1 9. The process according to claim 8 wherein said step of partial removing
2 comprises forming second conductive regions accommodated inside respective
3 ones of said second recesses.
- 1 10. The process according to claim 9 wherein said second conductive regions
2 comprise resistors.

1 11. The process according to claim 9 wherein second conductive regions
2 comprise first plates of respective capacitors.

1 12. The process according to claim 1 wherein said step of forming recesses
2 comprises performing at least one first masked etch of said insulation structures.

1 13. The process according to claim 12 wherein said step of forming recesses
2 comprises performing a second masked etch of said insulation structures.

1 14. The process according to claim 1 wherein said step of partially removing
2 comprises planarizing said wafer.

1 15. The process according to claim 1 wherein said step of partially removing
2 is followed by the steps of:

- 3 - forming a dielectric layer on top of said wafer;
- 4 - forming a second conductive layer on top of said dielectric layer; and
- 5 - selectively removing said dielectric layer and said second conductive layer.

1 16. The process according to claim 15 wherein said step of selectively
2 removing comprises forming third conductive regions.

1 17. The process according to claim 6, wherein said third conductive regions
2 comprise control gates of said memory cells.

1 18. The process according to claim 11 wherein said third conductive regions
2 comprise second plates of said capacitors.

1 19. An integrated electronic device comprising:

- 2 - a semiconductor body having a substrate; and

3 - a plurality of insulation structures delimiting active areas and having
4 respective portions projecting from said substrate; wherein said insulation structures
5 have respective recesses, which accommodate at least partially conductive regions.

1 20. The device according to claim 19 wherein said recesses are defined
2 laterally with respect to respective projecting portions of said insulation structures.

1 21. The device according to claim 19 wherein said conductive regions
2 comprise terminals of memory cells arranged on top of respective said active areas
3 and extending laterally inside at least one of said recesses.

1 22. The device according to claim 19 wherein said recesses are defined
2 centrally with respect to respective said projecting portions of said insulation
3 structures.

1 23. The device according to claim 22 wherein said conductive regions are
2 entirely accommodated inside respective said recesses.

1 24. The device according to claim 22 wherein said conductive regions
2 comprise resistors.

1 25. The device according to claim 22 wherein said conductive regions
2 comprise first plates of capacitors.

1 26. An integrated circuit, comprising:

2 a substrate having an active region;

3 first and second insulators disposed adjacent to the active region and defining
4 a recess over a portion of the active region and over a portion of one of the
5 insulators; and

6 a first conductor disposed in the recess.

1 27. The integrated circuit of claim 26 wherein the first and second
2 insulators respectively comprise first and second projections that define the recess.

1 28. The integrated circuit of claim 26, further comprising:

2 first and second trenches disposed in the substrate; and

3 wherein the first and second insulators are respectively disposed in the first
4 and second trenches.

1 29. The integrated circuit of claim 26 wherein the first and second
2 insulators define the recess over respective portions of both the first and second
3 insulators.

1 30. The integrated circuit of claim 26, further comprising a third insulator
2 disposed between the first conductor and the active region of the substrate.

1 31. The integrated circuit of claim 26 wherein the active region and the
2 conductor compose a memory cell.

1 32. The integrated circuit of claim 26 wherein the conductor composes a
2 floating gate of a nonvolatile memory cell.

1 33. The integrated circuit of claim 26, further comprising:

2 a third insulator disposed on the first conductor; and

3 a second conductor disposed on the third insulator and overlapping the first
4 conductor.

1 34. An integrated circuit, comprising:
2 a substrate;
3 a first insulator disposed in the substrate and defining a recess; and
4 a first conductor disposed in the recess.

1 35. The integrated circuit of claim 34 wherein the first insulator comprises
2 projections that define the recess.

1 36. The integrated circuit of claim 34, further comprising:
2 a trench disposed in the substrate; and
3 wherein the first insulator is disposed in the trench.

1 37. The integrated circuit of claim 34 wherein the first conductor composes
2 a resistor.

1 38. The integrated circuit of claim 34 wherein the first conductor composes
2 a plate of a capacitor.

1 39. The integrated circuit of claim 34, further comprising:
2 a second insulator disposed on the first conductor; and
3 a second conductor disposed on the second insulator and overlapping the
4 first conductor.

1 40. A method, comprising:
2 forming first and second insulators in a substrate;
3 forming a recess in a portion of one of the insulators and over a region of the
4 substrate located adjacent to the first and second insulators; and
5 forming a first conductor in the recess.

1 41. The method of claim 40 wherein forming the first and second insulators
2 comprises:
3 forming first and second trenches in the substrate; and
4 forming an insulating material in the trenches.

1 42. The method of claim 40 wherein forming the recess comprises forming
2 the recess in respective portions of the first and second insulators.

1 43. The method of claim 40, further comprising forming a third insulator on
2 the region of the substrate located adjacent to the first and second insulators.

1 44. The method of claim 40, further comprising:
2 forming a third insulator on the first conductor; and

3 forming a second conductor on the third insulator and overlapping the first
4 conductor.

1 45. A method, comprising:
2 forming a first insulator in a substrate;
3 forming a recess in the first insulator; and
4 forming a first conductor in the recess.

1 46. The method of claim 45 wherein forming the first insulator comprises:
2 forming a trench in the substrate; and
3 forming an insulator material in the trench.

1 47. The method of claim 45, further comprising forming a second insulator
2 on the first conductor.

1 48. The method of claim 45, further comprising:
2 forming a second insulator on the first conductor; and
3 forming a second conductor on the second insulator.